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DEVICES WITH ANGULARLY ADJUSTABLE SANDING UNITS

BACKGROUND OF THE INVENTION

[0001] This invention describes previously unknown devices with obliquely alignable belt sanding units, previously unknown design characteristics of belt sanding units aligned obliquely, and previously unknown applications of devices with obliquely alignable belt sanding units.

BRIEF DESCRIPTION OF THE DRAWINGS

To illustrate this invention:

[0002] Drawing 1 showing a conventional sanding unit with sanding belt 11, a contact device, here in the form of a segmented sanding pad 13 made up of single segments 12, and a series of contact rollers 14 for controlling the segmented sanding pad, with a feed table 15.

[0003] Drawing 2 showing a top/bottom unit with sanding pads 16, 17, which, contrary to the obliquely aligned sanding unit, are aligned perpendicularly to the feed direction.

[0004] Drawing 3 showing a sanding unit with its axis of rotation 20 aligned obliquely to its feed direction, here equipped with a segmented sanding pad 13, which is in the same oblique alignment as the unit as a whole, as is the series of contact rollers 14 for the control of the segmented sanding pad 13, which here is applied perpendicularly to the feed direction. Due to this arrangement of contact rollers 14, differing from the oblique alignment of the segmented sanding pad 13, the distances vary along the working width between the individual contact rollers and the corresponding segments controlled by them. Section a is therefore shorter than section b.

[0005] Drawing 4 shows the same representation of the sanding pad as Drawing 3, but with a contact roller series 14 in the same oblique alignment as the sanding assembly.

[0006] Drawing 5 shows an obliquely alignable unit with a motor 18 for rotation 22 and drive belt 19.

[0007] Drawing 6 shows a single segment 12 of a segmented sanding pad with its axis of rotation 21.

DETAILED DESCRIPTION OF THE INVENTION

[0008] The current state of technology includes top/bottom sanding systems with belt sanding units which are aligned slightly obliquely to the feed direction. The two pressure beams, required to establish contact between the workpiece and the sanding belt, referred to as sanding pads 16, 17, are aligned at 90° to the workpiece. This 90° alignment of the sanding pad for the obliquely aligned sanding belt requires a sanding unit which affords a large amount of space, but which can guarantee a straight workpiece throughfeed even when there is an interruption to the workpiece surface, which is unavoidable for sanding operations from below.

[0009] It is also known in professional circles that sanding belts obliquely aligned to the feed direction have the advantage over those which work straight in the feed direction, that any imperfections (e.g. sawdust, knot fallout, contamination with glue, dust, etc.) do not lie in straight lines, rather repeat laterally along the workpiece. They therefore appear less serious and frequent. The oblique sanding marks themselves are not disturbing on homogeneous workpieces or those which are treated further after sanding (lamination, coating, etc.), though naturally not on structured surfaces (e.g. grained timber). Sanding with obliquely aligned belts is therefore not common. An exception are the above-mentioned top/bottom sanding units. And even with these the application is limited to MDF panels with high surface quality requirements. No such requirements for flawless surface quality exist however for e.g. chip board (these are usually subsequently veneered), while veneer or solid wood, as mentioned, normally do not tolerate any sanding marks. An advantage of obliquely aligned sanders becomes evident with intermediate sanding between paint or varnish coats. For this to date unknown application other preconditions have had to be fulfilled: part of this invention is that previously, due to the thinner paint or varnish coat, the obliquely aligned sanding unit was applied at lower sanding belt abrasive speeds (i.e. about 50% or less than the

standard speed for high-grade abrasion of around 20 m/s) and/or a specially thin sanding pad. The corresponding devices - e.g. RPM regulation via a frequency converter and the use of electronically controlled segmented sanding pads - are known, but not their combination or simultaneous application with obliquely aligned sanders.

[0010] To the contrary of industrial panel finishing (e.g. MDF panels), coating and intermediate coat sanding is undertaken mostly in medium-sized businesses. These have special requirements: mainly that the same unit should sand wood panels (solid or veneer) and coated surfaces. While the straight sand is the first requirement, the oblique sand option offers the nominated advantages to surface finishing. The sanders must therefore - as this invention describes - be adjustable. Should the sanding pad also be aligned obliquely - as in the case of segmented sanding pads - then there must also be an automatic switchover from straight to oblique (and vice-versa) of the electronic segmented sanding pad segments 12 around their axis of rotation 21. Since their application is controlled at infeed by means of contact rollers 14, the control must also be made "obliquely alignable". This is achieved either through the use of a segmented pressure or contact roller series 14, which rotates parallel to the sanding unit (and which aligns e.g. via a parallelogram suspension aligned in the feed direction), or in the case of contact roller fixed position, via a regulated compensation across the working width of the varying section gap between contact rollers and segments.

[0011] Since not all surfaces, coating types etc., have the same properties, the oblique alignment of the sanding unit and the alignment of the segments 12 of the segmented sanding pad 13 should be possible steplessly.

[0012] A further requirement of the medium-sized company is that the sanding unit be designed compactly. This requirement is satisfied by rotation (with supports on both sides) of the complete assembly body (including belt tensioning, oscillation, safety and dust extraction assemblies), including the sanding pad 13. Preferably not the drive motor 18. Although various possible points of rotation are possible, for compact design that of the vertical middle axis of the drive belt 19 is best.